

MAT 589: INTRODUCTION TO ALGEBRAIC GEOMETRY (SPRING 2021)

CHRISTIAN SCHNELL

BASIC INFORMATION

The course is scheduled for Tuesday and Thursday, 1:15pm to 2:35pm. For the time being, we meet in person, in Physics P-127; if you prefer not to be in a room with several other people, you can join remotely (see below). Please note that everyone is required to wear a mask during class (unless approved for an exception for medical reasons by the university).

OFFICE HOURS

My office is 3-117; office hours will be held, via Zoom, on Fridays from 1:00pm to 3:00pm (or by appointment). The meeting ID is 296 508 2928, and the passcode is `liegroup`; here is a direct link:

<https://stonybrook.zoom.us/j/2965082928?pwd=TmJHa2gxUD1GSURB0UdJUVowSEwzdz09>

You can contact me by email at `christian.schnell@stonybrook.edu`.

COURSE DESCRIPTION

The purpose of MAT 589 is to introduce students to some of the fundamental concepts and results in algebraic geometry. Ideally, you already know some basic commutative algebra and have taken MAT 545 – but if you have not, then do not worry about it!

We are going to follow the *Algebraic Geometry* lecture notes by Andreas Gathmann; you can find a link to the PDF file on the course website at

<http://www.math.stonybrook.edu/cschnell/mat589/>

Gathmann's notes cover the basic theory of algebraic varieties (over algebraically closed fields), and end with a discussion of schemes, coherent sheaves of \mathcal{O} -modules, and cohomology. From time to time, we will also use other texts (such as Michael Artin's *Notes for a Course in Algebraic Geometry*). Before each class, I am going to post a reading assignment to the course website; during class, we are going to discuss the contents of the text, answer questions, talk about related material if necessary, go over examples, and do some exercises. This only makes sense if everyone has spent an hour or two actually reading the text, so please put in some time and read the assigned text beforehand.

GRADES

This semester, MAT 589 will be graded on a S/U scale. If you are taking MAT 589 for a grade, I expect you to do the following:

- (1) attend class on a regular basis,
- (2) participate in the discussion (either in person or remotely),
- (3) hand in solutions to the homework assignments.

REMOTE ACCESS

If you are planning to attend remotely, here is what you need to do:

- (1) Download and install the *Microsoft Teams* app. To download it, go to <https://teams.microsoft.com>, sign in with your Stony Brook Net ID and password, and then click on the icon in the bottom left corner of the screen.
- (2) Install the *Microsoft Whiteboard* app. On iPhone/iPad, for example, you can download the app from the App Store; you will also need a second app called *Microsoft Authenticator*, to be able to authenticate through your Stony Brook account. If you do not have a mobile device, you can run the app from inside a web browser by going to <https://whiteboard.microsoft.com>; note that the web-based app currently works less well than the mobile ones.

At the beginning of each lecture, sign in to *Microsoft Teams*. We will call you from inside the classroom, and once you are connected, you will be able to see and hear what is going on in the room; conversely, video from your camera will be projected to a screen in the classroom, and when you unmute your microphone, we will be able to hear you. The classroom is equipped with a huge electronic whiteboard; after you sign in to *Microsoft Whiteboard*, you will be able to see the whiteboard, write on it, etc.

UNIVERSITY POLICIES

Student Accessibility Support Services. If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Student Accessibility Support Center, ECC (Educational Communications Center) Building, Room 128, (631)632-6748. They will determine with you what accommodations, if any, are necessary and appropriate. All information and documentation is confidential. Please see <https://www.stonybrook.edu/commcms/studentaffairs/sasc/facstaff/syllabus.php> for more information.

Academic Integrity Statement. Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty is required to report any suspected instances of academic dishonesty to the Academic Judiciary. Faculty in the Health Sciences Center

(School of Health Technology & Management, Nursing, Social Welfare, Dental Medicine) and School of Medicine are required to follow their school-specific procedures. For more comprehensive information on academic integrity, including categories of academic dishonesty please refer to the academic judiciary website at

http://www.stonybrook.edu/commcms/academic_integrity/index.html.

Critical Incident Management Statement. Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of University Community Standards any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn. Faculty in the HSC Schools and the School of Medicine are required to follow their school-specific procedures. Further information about most academic matters can be found in the Undergraduate Bulletin, the Undergraduate Class Schedule, and the Faculty-Employee Handbook.